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NEWSLETTER

of the

Hawaiian Botanical Society

Volume IX
Numbers 1, 2, and 3
June 1970

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UNIVERSITY OF HAWAII
HONOLULU, HAWAII

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N. B. Volume VIII, Numbers 4 and 5 were never issued.

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SPECIAL

Summer Foray

Dr. Adrian Bush, who is in charge of the Summer Foray, July 4, has announced that the event will be held at his home, 3860 Round Top Drive. Come at 9 A. M. or later. Bring picnic lunch. The host will serve liquid refreshments. Guests may botanize in the extensive grounds and garden. A short hike on the Manoa Trail is possible for those who wish for a walk.

PAPERS

H A W A I I ' S L A N D U S E L A W [1/]

By

Ramon Duran, Executive Officer
Land Use Commission, State of Hawaii

Hawaii's Land Use Law providing for State zoning was the result of three significant actions by the State government.

The 1957 Territorial legislature passed Act 35 establishing the Land Study Bureau to classify all lands in the territory in order to provide a sound basis for subsequent land uses. The work of the Bureau to date has been the classification of agricultural lands.

1/ Presented at meeting of Hawaiian Botanical Society, March 2, 1970.

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IT

During the same year the legislature established a Territorial Planning Office and directed it to prepare a General Plan of the Territory to serve as a guide for the future physical and economical development of the State.

The same year the legislature also passed Act 234 providing a comprehensive forest and water reserve zoning law to be administered by the Board of Commissioners of Agriculture and Forestry, now the Department of Land and Natural Resources.

During the preparation of the State General Plan, it became evident that the development of land for urban uses in many cases tended to occur in areas where it was uneconomical for public agencies to provide property service facilities. In many other cases, urban uses were occurring on prime agricultural lands which contributed significantly to the basic economy of the State. The study also showed that there was adequate land on all of the islands to accommodate the urban needs for the next 20 years without encroaching into prime agricultural lands.

Thus, Act 187 of the 1961 legislature was passed in order to implement some of the recommendations of the State General Plan; to discourage urban development that would be costly to government; and to protect prime agricultural lands from urban encroachment.

The law created a Commission of nine members responsible for districting all of the lands in the State into four district classifications--Urban, Rural, Agricultural, and Conservation.

Land uses within the Urban Districts are determined and administered solely by Counties. In the Agricultural and Rural Districts, land uses are administered by the Counties in consonant with the regulations established by the State Land Use Commission. In the Conservation Districts, land uses are administered solely by the State Department of Land and Natural Resources.

The significant feature of the Land Use Law is the requirement that the district boundaries and regulations by reviewed and re-established by the Land Use Commission every five years. The first year boundary review was completed last summer during 1969. It was interesting to note that the consultants to the Commission reported that there was ample vacant land within the existing Urban District in all of the Counties to accommodate the anticipated growth during the next ten years. It is also interesting to note that during the course of the boundary review, over 50,000 additional acres were requested by landowners and developers to be added to the Urban District. Probably the most startling fact concerning future urban development is that the major landowners between Pearl Harbor and Wahiawa revealed long-range urban development plans for their lands presently in cane and pine cultivation. When it is realized that approximately 10 percent of the total land area of the State is considered prime agricultural land and approximately half of this prime agricultural land is located on Oahu, where over 80 percent of the State's population resides, the importance of preserving prime agricultural land for agricultural purposes can be realized. The large property owners between Pearl Harbor and Wahiawa have some of the best agricultural lands in the State. To further complicate the problem of preserving prime agricultural land, is the fact that the University of Hawaii Board of Regents is interested in locating a second university campus in the Leeward area.

The State and the City & County of Honolulu are now on the threshold of making a major land use decision regarding one of the fundamental purposes of the Land Use Law--that of preserving prime agricultural land. This is whether to continue to preserve prime agricultural land on Oahu or to permit these lands to yield to the urban pressure. This decision should be made only after evaluating all of the advantages and disadvantages by all concerned. The decision reached must be in the best long-range interest of the general welfare of the State.

FORMOSA SWEETGUM

By

Craig D. Whitesell
Institute of Pacific Islands Forestry, Honolulu

Formosa sweetgum (Liquidambar formosana Hance.) has excited interest as an ornamental in Hawaii and Guam. What draws attention to this tree is the habit of its foliage to turn red during the "winter" months. This feature appeals to those who miss the colorful fall display of Mainland hardwoods. Formosa sweetgum appears adapted to a wide variety of sites, as survival is high wherever it has been planted. Native to Taiwan and China, it grows up to 130' in height. Although similar to the sweetgum indigenous to the southeastern United States (L. styraciflua L.), it differs in having leaves with three lobes rather than five, and does not develop corky ridges on the stems. Adaptability trials are being made by the U. S. Forest Service.

URUGUAY--ITS TREES

By

Russell K. LeBarron[1/]
Hawaii Division of Forestry

Uruguay is one of the smallest countries in South America with a land area about the size of North Dakota. More than half of its small population of 2.6 million people live in the capitol city of Montevideo. The population is almost stable in numbers; a rather unique situation in the world today.

The soils and rocks are old and the terrain is level to gently rolling. The highest point is only 500 meters above sea level. Soils range in texture from sands and silts to clays. Generally, sub-drainage is poor and this has had a strong impact on the vegetation.

1/ Paper presented at meeting of Hawaiian Botanical Society, January 5, 1970. The writer is a forester who went to Uruguay in 1966 and spent two years there as an employee of the Food and Agriculture Organization of the United Nations. His primary mission was to investigate the feasibility of producing pulpwood to supply the country's needs for paper products, especially packaging, books, and magazines. This was one of many technical assistance programs which agencies of the United Nations provide for underdeveloped countries.

The climate is about like that of Georgia except that winters are milder and winds are more persistent. Snow is uncommon and temperatures seldom drop much below freezing. Annual rainfall averages from 25 to 40 inches in different sections. The native vegetation is a good deal like that of our own mid-western states--predominantly perennial grasses, forbs, and low shrubs which are able to endure periodic droughts and much wind.

The people of Uruguay are almost wholly of European origin; predominantly Basques and other Spanish, as well as many Italians. Indians almost disappeared long ago. Negroes are few in numbers. In language, culture, and economy, Uruguay is virtually a province of Argentina, though the people are very jealous of their political independence and their democratic government. They have not had a revolution for 60 years. Often, they have been regarded as the best-educated, most prosperous, and socially advanced of all Latin-Americans. Unfortunately, the social reforms including nationalization of the major industries and generous pension and welfare programs have boomeranged. Today the peso is valued at 250 per U. S. dollar and the people and the economy are in serious distress. The wealthy have sent much of their money abroad. Many of the better-educated scientists, professional people, and technicians have emigrated to Argentina, the United States, and Europe.

The economy is based heavily upon beef and wool. Absentee ownership is all too common and management and cultural practices are generally bad. The country has the potential to support a larger population on a higher level of prosperity. It could become a great wheat, rice, fruit, and vegetable growing region. Furthermore, it has the technical know-how, but seems to suffer from the strange paralysis which has held back much of Latin-America. One wise Latin-American said, "Uruguay is not an underdeveloped country; it is a badly developed country." I agree.

The above briefly describes the situation when I arrived in Uruguay in 1966 as a technical advisor on forestry to the Government. However, awareness came slowly while I studied the outlook for forestry. I shall not talk here about my specific project, but more generally about the kinds of trees that are found in Uruguay and how they are used.

Woody vegetation is said to have covered about 15 percent of the land when Europeans arrived more than two centuries ago. Today this has shrunk to 3 percent as a result of grazing, burning to improve the yield of forage, and cutting for fuel and posts. Most of the native trees and shrubs are small, spiny, and crooked, with very hard wood. Salix humboldtiana, the only native willow in the Southern Hemisphere is an exception. The most common families are Myrtaceae and Leguminosae. Uruguayan trees and shrubs which have been brought to Hawaii include lantana, klu, kiawe, waiawi, ceibo (Erythrina cristi-galli), and two palms, Arecastrum and Butia. Incidentally, the Brazilian cardinal, which is well-known in Hawaii is native to Uruguay. Somewhat amusingly, lantana is a favored decorative shrub in Montevideo. The native palms and ceibo are also popular ornamentals in Montevideo.

By far the most popular native tree for use along streets is Tipuana tipu. It is a member of the family Papillioniodaceae. It has rather handsome and profuse yellow flowers and appears to be a very good tree. I do not know whether it

has been used in Hawaii. The "pepper tree," Schinus molle, is indigenous to Uruguay and is used extensively as a drought-resistant roadside tree in the country.

The country's most distinctive "tree" is a famous plant of the pampas where it provides welcome shade to gauchos and cattle. This is the Ombú, Phytolacca dioica, which some botanists say is a giant herb, rather than a tree. It always has more than one stem, and the xylem tissue is a soft, porous, laminated material. It is long-lived and drought-hardy.

Popular ornamentals brought in from sub-tropical parts of Brazil, Paraguay, and Argentina include a bombax, Choresia speciosa, which has profuse and lovely rosy or white flowers, Peltophorum dubium which is much like Hawaii's yellow poinciana, and jacaranda. The latter is well-known here. The two former ones deserve to be cultivated in Hawaii.

Uruguay has borrowed heavily from Australia for trees. These include many species of eucalypts, several acacias, araucarias, casuarina, and others. The eucalypts are by far the most widely planted trees. They were brought in more than 100 years ago and have been used with great success for windbreaks, livestock shelters, fuel, posts, scaffolding, and lumber. Among the better-known kinds are globulus, camaldulensis, tereticornis, saligna, botryoides, sideroxylon, cineria, and ficifolia. They have contributed greatly to the country's comfort, appearance, and economy. Uruguay has no fossil fuels so wood is important for both domestic and industrial fuel.

The main borrowings from Europe are the plane tree (Platanus), and maritime pine (Pinus pinaster). The plane tree is probably the world's most common city street tree. Maritime pine is second only to the eucalypts in frequency. It has been used extensively, together with Acacia longifolia for fixing sand dunes. With them, about ten thousand hectares of chilly, windy, sterile, coastal sand dunes have been converted into pleasant residential and recreational sites. Other European trees include ash, oaks, maple, several pines, and a palm from the Canary Islands. Hybrid poplars are coming in as a prospective material for box lumber.

Asia's main contribution is Chinaberry (Melia azaderach); a common street tree, also used for lumber occasionally.

North America has contributed many species including at least ten pines, Monterey cypress, bald cypress, American ash, boxelder, hackberry, black locust, and eastern cottonwood. Eastern cottonwood grows well on fertile agricultural bottom lands for box lumber; loblolly pine and slash pine, along with the Mexican pine (P. patula), have great promise for pulpwood and lumber; and Monterey cypress is a good windbreak tree. The other North American species do not have much to recommend them.

The greatest hazard to tree planting is the leaf-cutting ant; also called umbrella ant. It is a plague which must be fought with vigor during the period of initial establishment.

Uruguayans have a great deal of skill in planting trees. Their methods are rather primitive and depend heavily upon liberal use of low-cost manpower.

Forestry is taught as one of the specializations in agronomy in the University of Montevideo. Graduates are called "Ingeneiro Agrónomo" (Agronomic Engineer). A subprofessional level of forestry is taught in a separate "Escuela de Silvicultura" as a one-or two-year course for high school graduates. Most of the country's principal foresters have travelled abroad in various countries including Israel, Russia, Spain, France, and the United States. They have, however, had little opportunity to employ the skills of forestry beyond seed collection, nursery propagation, planting, recreation and landscape architecture. Their understanding of management, protection, and utilization, as well as ecology and watershed management is limited. It is likely to remain so unless and until the country builds up larger and more efficient forest industries based upon man-made forests.

PLANTS RECORDED FROM KAHOOLAWE

By

Charles H. Lamoureux
Department of Botany, University of Hawaii

May 1970

This list includes those higher plants which have been collected on the island of Kahoolawe, as evidenced by collections preserved in herbaria or notes made by reliable observers. It does not include species reported only from gardens or crop plants.

Mr. Russell LeBarron of the Division of Forestry, Hawaii State Department of Lands and Natural Resources (1969 and 1970 observations), Mr. E. H. Bryan, Jr. of the Pacific Scientific Information Center, Bernice P. Bishop Museum, and Mrs. Sheila B. Myhre, a student at the University of Hawaii, have been of great help to me in compiling this list.

For each plant on the list the following information is given:

Botanical name; Hawaiian or haole name; the last record from Kahoolawe (observer and date); and information as to whether the species is native or introduced:

* = species endemic to Kahoolawe (found only on Kahoolawe and no place else on earth)

N = species native to the Hawaiian Islands, but found on other islands as well as Kahoolawe.

X = species introduced to the Hawaiian Island by man.

FERNS

N *Doryopteris decipiens* (Hook.) J. Sm. "iwa iwa"
Forbes, 1913

MONOCOTYLEDONS

AMARYLLIDACEAE - Amaryllis family

X *Agave americana* L. "century plant"
(or *A. sisalana*) "sisal"
Still on island, LeBarron (Species uncertain)

GRAMINEAE - Grass family

X *Andropogon pertusus* (L.) Willd. "pitted beardgrass"
Still on island, LeBarron

X *Cenchrus echinatus* L. "sandbur", "umealu"
Bryan, 1931
Still on island, LeBarron

X *Cynodon dactylon* (L.) Pers. "Bermuda grass",
Bryan, 1931; photo, 1939 "manienie"
Still on island, LeBarron

X *Chloris inflata* Link "swollen fingergrass"
Bryan, 1931
Still on island, LeBarron

X *Chloris virgata* "feather finger grass"
Still on island, LeBarron

X *Digitaria sp.* "kukaepua'a"
Reported by Nahaolelua and Richardson, 1857

N *Eragrostis variabilis* gaud. "kalamalo"
Reported by Nahaolelua and Richardson, 1857

N *Heteropogon contortus* (L.) Beauv. "piligrass"
Still on island, LeBarron

X *Melinis minutiflora* Beauv. "molasses grass"
Stearns, 1939

X *Panicum maximum* Jacq. "Guinea grass"
Bryan, 1931

X *Setaria verticillata* (L.) Beauv. "bristly foxtail"
Still on island, LeBarron

N *Sporobolus virginicus* (L.) Kunth "'aki'aki"
Bryan, 1931

LILIACEAE - Lily family

X Cordyline terminalis (L.) Kunth — "ti"
Stearns, 1939

DICOTYLEDONS

ARALIACEAE - Panak family

N Reynoldsia sandwicensis Gray — "ohe makai"
Reported by Forbes, 1913, as formerly present

ASCLEPIADACEAE - Milkweed family

X Asclepias curassavica L. — "butterfly weed", "lau-lele"
Bryan, 1931

BATIDACEAE

X Batis maritima L. — "pickle weed", "akulikuli-kai"
Still on island, LeBarron

CACTACEAE - Cactus family

X Opuntia megacantha Salm-Dyck — "panini"
Bryan, 1931
Still on island, LeBarron

CAPPARIDACEAE - Caper family

N Capparis sandwichiana DC. — "puapilo"
Bryan, 1931

CASUARINACEAE - Casuarina family

X Casuarina sp. — "ironwood"
Still on island, LeBarron

CHENOPODIACEAE - Goosefoot family

X Atriplex semibaccata R. Br. — "Australian salt bush"
Still on island, LeBarron

X Chenopodium sp. — "lambs quarters"
Forbes, 1913

COMPOSITAE - Sunflower family

X Acanthospermum australe (Loefl.) Ktze — "star bur"
Bryan, 1931

X	Emilia sonchifolia (L.) DC. Bryan, 1931	"Flora's paintbrush"
X	Heterotheca grandiflora Nutt. Bryan, 1931	"telegraph plant"
*	Lipochaeta bryanii Sherff Collected only by Bryan in 1931	"nehe"
N	Lipochaeta connata (gaud.) DC. Collected only by Remy in 1851-1855	"nehe"
*	Lipochaeta kahoolawensis Sherff Collected only by Remy in 1851-1855	"nehe"
X	Sonchus oleraceus L. Forbes, 1913	"pualele"
X	Tridax procumbens L. Bryan, 1931	"coat buttons"
X	Verbesina encelioides (Cav.) Benth. Bryan, 1931 Still on island, LeBarron	"golden crown-beard"
X	Xanthium strumarium L. Bryan, 1931 Still on island, LeBarron	"cocklebur", "kikania"
	CONVOLVULACEAE - Morning glory family	
N	Ipomoea pes-caprae (L.) Sweet Bryan, 1931	"beach morning glory"
X	Ipomoea sp. Bryan, 1931	"morning glory"
N	Jacquemontia sandwicensis Gray Bryan, 1931	"pa'u-o-Hi'iaka"
X	Merremia aegyptia (L.) Urban Davis, 1961	"hairy merremia"
	EPACRIDACEAE - Epacris family	
N	Styphelia tameiameiae (Cham.) F. Muell Reported by Forbes, 1913, as formerly present	"pu kiawe"
	EUPHORBIACEAE - Spurge family	
X	Euphorbia hirta L. Forbes, 1913	"hairy spurge"
N	Euphorbia multiformis H. + A. Stokes, 1913	"akoko"
X	Euphorbia thymifolia L.	"thyme-leaved spurge"
	GOODENIACEAE - goodenia family	
N	Scaevola taccada (gaertn.) Roxb. Bryan, 1931	"beach naupaka"
	LEGUMINOSAE - Pea family	
X	Acacia farnesiana (L.) Willd. Still on island, LeBarron	"klu"

X	Cajanus flavus DC. Bryan, 1931	"pigeon pea"
X	Desmodium triflorum (L.) DC. Forbes, 1913	"three-flowered beggarweed"
X	Desmodium uncinatum (Jacq.) DC. Bryan, 1931	"Spanish clover"
N	Erythrina sandwicensis Deg. Few trees still on island, LeBarron	"wili wili"
X	Indogofera suffruticosa Mill. Still on island, LeBarron	"indigo", "iniko"
X	Leucaena leucocephala (Lam.) dewit Still on island, LeBarron	"Koa haole"
X	Mimosa pudica L. Forbes, 1913	"sensitive plant"
X	Phaseolus lathyroides L. Bryan, 1931	"wild bean"
X	Prosopis pallida (H & B ex Kunth) HBK Still on island, LeBarron	"Kiawe"
	MALVACEAE - Mallow family	
N	Abutilon incanum (Link) Sweet Forbes, 1913	"ma'o"
N	Gossypium tomentosum Nutt. Forbes, 1913	"ma'o", "Hawaiian cotton"
N	Hibiscus brackenridgei gray Collected only by Remy in 1851-1855	"ma'ohauhele"
N	Sida sp. Still on island, LeBarron	"ilima"
	MYOPORACEAE - Myoporum family	
N	Myoporum sandwicense (DC.) Gray Reported by Forbes, 1913, as formerly present	"naio"
	MYRTACEAE - Myrtle family	
X	Eucalyptus camaldulensis Dehnh.	"Murray red gum"
X	Eucalyptus citriodora Hook.	"lemon-scented gum"
X	Eucalyptus sp. At least three species still on island, LeBarron	"Eucalyptus"
X	Psidium guajava L. Stearns, 1939	"guava"
	NYCTAGINACEAE - Four o'clock family	
N	Boerhavia diffusa L. Bryan, 1931	"alena"
	PAPAVERACEAE - Poppy family	
N	Argemone glauca var. inermis Deg. and Deg. Bryan, 1931. This variety was known only from Kahoolawe	"pua Kala"

PORTULACACEAE - Portulaca family

N Portulaca lutea Sol. "akulikuli"
Forbes, 1913

N Portulaca sclerocarpa Gray "ihimakole"
Collected only by Lydgate in1860's

RHAMNACEAE - Buckthorn family

* Gouania cucullata St. John

* Gouvania remyi St. John
Both species collected only by Jules Remy, 1851-1855

SANTALACEAE - Sandalwood family

N Santalum ellipticum Gaud. "sandalwood","iliahi"
Collected by Remy in 1851-1855, and by Stearns in 1939

SAPINDACEAE - Soapberry family

N Dodonaea viscosa L. "a'ali'i"
Reported by Forbes, 1913, as formerly present

SOLANACEAE - Tomato family

N Lycium sandwicense gray "'ohelo Kai"
Bryan, 1931

X Nicotiana glauca grah. "tree tobacco"
Still on island, LeBarron

STERCULIACEAE - Cocoa family

N Waltheria americana L. "hialoa", "uhaloa"
Still on island, LeBarron

URTICACEAE - Nettle family

* Neraudia kahoolawensis Hbd. "oloa"
Collected only by Lydgate in 1860's

VERBENACEAE - Verbena family

X Lantana camara L. "lantana"
Still on island, LeBarron

X Verbena litoralis HBK. "ha'uoi"
Still on island, LeBarron

ZYGOPHYLLACEAE - Caltrop family

N Tribulus cistoides L. "nohu"
Forbes, 1913

Editor's Notice

Suggestions from readers and comments calling attention to errors and omissions will be welcomed, and will be acted upon if possible. Newsy items of interest to botanists and workers in closely allied fields are requested. They will be published in forthcoming issues of the Newsletter on a "space available" basis if deemed timely and worthy. Letters on appropriate, controversial subjects are solicited.

EVENTS

Bogor Botanical Garden Hit By Storm

By Aprilany Soegiarto
Dept. of Botany, U. of H.

A rather unusual cyclonic storm struck the Bogor Botanical Garden on January 4, 1970. The damage caused by this storm is heavy. Hundreds of trees were uprooted, scores of people died and many more were seriously injured. The damages cannot be measured in terms of money, because the importance and value of the garden are in the living scientific collection. At this writing the staff members of the Nationa Biological Institute are still making an inventory of the damage to this collection and preparing for the heavy tasks ahead in restoring and rebuilding.

Anybody who has seen or heard of the Bogor Garden will agree that this is the oldest, the largest, and probably also the most beautiful garden in the tropics. It has served the world scientific community for over one hundred and fifty years. Hundreds of scientists from all over the world have worked at or visited this famous garden. As one of the divisions of the National Biological Institute, it now becomes the seat of the SEAMEC (The South East Asian Ministry of Education Council) Tropical Biology Center.

The Bogor Botanical Garden is also invaluable to the Indonesian economy. Many important crop plants were first introduced into Indonesia through this garden: rubber (Hevea brasiliensis), tea (Thea spp.), cacao (Theobroma cacao), tobacco (Nicotiana tobacum), sugarcane (Saccharum officinarum), oil palm (Elaeis guineensis), cassava (Manihot utilissima), and corn (Zea mays) to name just a few. In fact the present Indonesian Ministry of Agriculture had its origin at the Bogor Botanical Garden.

Symposium on Kahoolawe

A symposium sponsored by the Maui Chapter of the Conservation Council of Hawaii was held on May 20 concerning the island of Kahoolawe. Participants included representatives of the U. S. Navy lead by Admiral Davis, Commandant of the 14th Naval District, Mayor Elmer Cravalho, Maui citizens including two former residents of Kahoolawe, Dr. Charles Lamoureux of the University of Hawaii, and William Sager, Assistant District Forester, Hawaii Division of Forestry. (See report on plants by Lamoureux.)

Kahoolawe has been used by the U. S. Department of National Defense since 1942 as a target, partly by aircraft, and partly by surface naval vessels. It is now held by the U. S. Navy under a Presidential Executive Order issued in 1954. In recent years, Maui residents have protested the use of the island for this purpose and Mayor Cravalho has actively advocated return of the island to civil control.

Very briefly, the history of the island: It has exceedingly limited supplies of fresh water, rainfall is low, and it has never supported more than a small human population. Goats have been present since about 1800. In the early 1800's, it was used as a place of exile by Hawaiians. Around 1865 it was leased for grazing by sheep and for many years was heavily overgrazed. This lead to extensive

destruction of native vegetation and soil losses from wind and water erosion. In the period 1910 to 1919, grazing was terminated and efforts were made, (unsuccessfully) to eliminate feral sheep and goats. From 1920 to 1941, it was again leased for grazing, this time by cattle. After Pearl Harbor, it was sub-leased by the U. S. Army as a bombing range and has been controlled by military forces since that date. About one-fourth of the surface, a central plateau, is denuded and has suffered massive erosion. The slopes likewise have eroded severely and support only a very sparse cover, predominantly kiawe. At present, the number of sheep on the island is small, but goats are abundant. The two kinds of hooved animals keep edible plants closely utilized, thus preventing the development of an adequate cover of vegetation.

Investigations by the Department of Land and Natural Resources have lead to the belief that although explosive military ordnance has been destructive, most of the damage has been caused by uncontrolled populations of feral goats and sheep. At present, the Department's Division of Fish and Game is making plans to work with the Navy to reduce the population of hooved animals. The Division of Forestry in the same Department is planning to install some small fenced exclosures to test revegetating the island.

At the symposium, the U. S. Navy representatives insisted that the island is vitally important for training personnel and testing ordnance. They also consider that surface travel by hunters or others is dangerous because of unexploded ordnance.

Correspondence with National Park Service

Following a report in the Star-Bulletin about a guided tour for visitors through Kipahulu Valley, President Clifford Smith wrote to the Superintendent of Haleakala National Park on May 5. Purpose was to learn the extent to which such tours might penetrate and endanger the environment of Kipahulu Valley. In a reply dated May 7, 1970, Superintendent Lynn H. Thompson replied, in part:

> "The hikes within the crater will be conducted over presently established trails and will offer groups or individuals the opportunity to enjoy a semi-wilderness experience with a knowledgeable guide.
>
> "The four-hour hike on Saturday mornings from the Seven Pools area could not, of course, begin to penetrate the Kipahulu Valley. The hike will take visitors on a loop trip to the base of some of the spectacular waterfalls within a 3-4 mile range of the parking area; all the trip well below the 3,000-foot elevation. Much of this area has been utilized over the years for taro, sugarcane, rubber, and presently, cattle raising. Part of the interpretation on this hike will cover man's impact on the land as well as the more traditional identification of flora.
>
> "The only "trail" through Kipahulu Valley is the one used by the expedition in 1967. The management plans for the valley envisage a scientific preserve to be entered only by qualified scientific research groups. In the future, a trail might be established along one of the ridges to enable hikers to glimpse the valley without disturbing it or introducing exotic weeds. As you probably know, the deeds conveying the land from the Nature Conservancy to the National Park Service specifically require that the Kipahulu Valley be managed as a scientific preserve.

> "We regret that the announcement in the Honolulu Star-Bulletin caused you any concern and hope this reply will offer you full assurance that our plans for the present and future will in no way infringe upon the unique integrity of the Kipahulu Valley."

Another letter was written by President Smith to the Superintendent of Hawaii Volcanoes National Park concerning the intent of a bill introduced by Senator Hiram L. Fong into the U. S. Congress. It related to the Olaa Section of Hawaii Volcanoes N. P., a tract of 9,000 acres which was transferred to the National Park as a wilderness area by Territorial Governor Oren E. Long in 1952. A reply by Acting Superintendent Arthur F. Hewett Jr. stated:

> "The current National Park Service draft Master Plan proposes that the Olaa Forest tract be officially included as part of Hawaii Volcanoes National Park. (Although the tract was conveyed to the Secretary of the Interior in 1952, thus far the Congress has not authorized the tract as a part of this National Park.) This means that the tract would be managed as a natural area. We want to assure you that we are sensitive to the great ecological value of this particular tract. We feel the area should continue to be managed as an oustanding botanical area.
>
> "Insofar as any facilities, we plan to someday provide an interpretive "window" for the area. This would be a short foot trail appropriate to ecological values. This would be combined with a modest visitor information facility alongside Wright Road on the perimeter of the area. We contemplate no development of the tract. Scientific research would, of course, be permitted.
>
> "The recent draft legislation by Senator Fong does not propose use of the Olaa Forest tract as a recreation area."

Natural Areas

During the period May 25-27, three representatives of the Governor's Committee on Preservation of Scientific Sites, J. Linsley Gressitt (Chairman), Bishop Museum, Charles H. Lamoureux, Botany Dept., U. H., and Andrew Berger, Zoology Dept., U. H., visited the Island of Hawaii to examine tracts of State lands in the Forest Reserves which have been recommended as Natural Area Preserves by the Division of Forestry and the Division of Fish and Game of the Department of Land and Natural Resources. They were accompanied by Libert Landgraf, District Forester, and Russell K. LeBarron, Resource Management Forester of the Division of Forestry and Ernest Kosaka, District Wildlife Biologist, Division of Fish and Game. Tracts visited included:

Puu Makaala (in Waiakea area)	2,600 acres
1942 Lava Flow	640 "
Laupahoehoe (Hamakua area)	4,000 "
Puna	25,000 "
Kohala Mts.	32,000 "
Malama-ki	1,400 "
Kipahoehoe (south Kona district)	5,500 "
Mauna Kea	25,000 "
Kipuka Ainahou	28,000 "

The proposed units encompass a wide variety of ecosystems from near sea level up to 11,000 feet elevation. Owing to severe rains, the Laupahoehoe unit could not be visited. The party also visited the Division of Forestry's Koai'a Sanctuary near Waimea.

A highlight of the trip was the observation by Dr. Berger of three species of native birds at low elevations, in one instance, only 250 feet above sea level.

On other islands, the Division of Forestry has recommended the following areas for consideration:

Maui	
Puu Kukui and Eke Crater (West Maui)	900 acres
Portions of East Maui Forest Reserves	42,400 "
Manawainui Valley	3,600 "
Kauai	
Nualolo	1,500 "
Hono O Na Pali	2,400 "
An extension to Alakai Wilderness Preserve	1,900 "

Final action to establish the above units must await processes that will result from the newly enacted law for creation of an advisory board on natural area preserves.

Legislation

The Legislature in its recently ended session passed two bills which are of special interest to conservationists. One provides for the creation of a board to establish policies and to advise on the selection and acquisition of a State-wide system of natural areas for scientific and educational purposes. The other new law creates an advisory board to review proposed introductions of animals (including birds) into the State or between islands within the State. The law applies only to actions of the Department of Land and Natural Resources (especially it's Division of Fish and Game.) It apparently does not apply to actions by private individuals such as land owners, hunters, and operators of pet shops. Thus, the law seems to have a built-in loophole which is not wholly protected by older quarantine regulations administered by the Hawaii Department of Agriculture. The old regulations control entrance into the State but not between islands.

Forestry Conference

The Twelfth Hawaii Annual Forestry Conference was held on Maui, May 14 and 15, 1970. Theme of the meeting was, "FORESTRY AND MAN'S CONCERN FOR ENVIRONMENT." The conference was sponsored jointly by the Chamber of Commerce of Hawaii, Maui Chamber of Commerce, Hawaii Division of Forestry, U. S. Forest Service and Society of American Foresters. The Wildlife Society joined with this conference to hold a symposium on the preceding day, May 13. Among the papers at the forestry conference were: "Kahoolawe--Can it be Reincarnated?", "Forest Reserve Management Planning", "Urban Forestry", "Forestry Research for the Pacific Islands", and "Koa Forests--What is Happening to Them?"

HONOR AWARDS

Science Fair Winners (April 6)

Senior Division--no award.

Intermediate Division--two awards.
Beverly Gay, First Prize for "Lichens and Air Pollution."
Janice Kato and Lynn Kagama, Second Prize for "The Effect of Tactile Stimuli on Mimosa pudice."

New Honorary Members

At the meeting of the Botanical Society on May 11, 1970, new Honorary Members were announced. Those present were introduced; absentees had their names read.

Harry L. Dennison
Ada B. Erwin
Helene Hoshino
S. W. G. Moir
J. Scott B. Pratt
Richard C. Tongg
Juliette O. Wentworth

"Most Likely to Reflect Credit"

At the regular meeting of the Hawaiian Botanical Society, June 1, 1970, the award, "The Senior Most Likely to Reflect Credit Upon Botany", was conferred upon Walter Tokushige. In addition to the recognition which the award signifies, the recipient's name will be engraved upon a plaque used for this purpose, and he will receive a check of $25.00. Selection of the individual for the honor is made by the Department of Botany, University of Hawaii.

Mr. Tokushige had a grade point average of 3.5. His interests are botany and geography. He has received a N.D.E.A. Fellowship under which he plans to study at U.C.L.A. for three years.

Abstract

Vegetation Recovering . . . . . little erosion on Hanalei watershed after fire

After a fire burned the Hanalei watershed on Kauai, June 18, 1967, transects and vegetation plots were established to record surface conditions and recovering vegetation. Four months after the fire, 86 percent of the transect length had a vegetation cover of less than 50 percent. Six months later, 94 percent of the transect length had a vegetation density of greater than 50 percent. Among the recovering herbaceous vegetation, fireweed was the dominant species. Uluhe regeneration had been low. Eight months after the fire, koa seedlings had a survival rate of 78 percent. Aerially seeded grasses and legumes were well established. No evidence of widespread erosion was found. OXFORD: 181.43.434:(969)

U. S. D. A. Forest Service Research Note PSW-191. 1969. Forest Service, P. O. Box 245, Berkeley, Calif. 94701.

PROCEEDINGS OF THE SOCIETY

The following are not complete minutes--only a few especially significant highlights of the meetings.

January 5, 1970.

a) Authorized payment of dues to Nature Conservancy, Conservation Council, Hawaiian Botanical Gardens Foundations, and Friends of Foster Gardens.
b) Dr. Maxwell Doty reported that the Western Society of Naturalists will hold it's annual meeting in Honolulu during the Christmas vacation period, 1970.
c) Speaker of the evening, Russell K. LeBarron, discussed "Uruguay--It's Tree".

February 2, 1970.

a) A bill in the legislature to supply financial support to the Bishop Museum was discussed and a motion was made and passed to support it.
b) The President announced a coming symposium by the Conservation Council about the management of the land and natural resources belonging to the State of Hawaii.
c) Storm damage to the Wahiawa Botanic Garden was reported and a plea made for volunteer help to rehabilitate the tract.
d) Storm damage to the Bogor Botanical Garden in Indonesia was mentioned. (See separate report by Aprilany Soegiarto.)
e) Speaker of the evening, Jim Barrows showed colorful slides dealing with croton culture and hybridization.

March 2, 1970.

a) A letter from the Volunteer Committee on Clean Air and Water was read.
b) Speaker of the evening, Ramon Duran of the Land Use Commission spoke about Hawaii's Land Use Law. (See separate report.)

April 6, 1970.

a) Motion made and passed to set annual dues for Junior Members at $1.00.
b) Plant donation and exchange--always an exciting event.
c) Announcement of Science Fair winners. (See separate report.)
d) Bills in legislature concerning natural areas and introduction of non-indigenous animals. (See "Legislation.")
e) Motion made and passed to donate $25.00 to Flora Pacifica.
f) Dr. Kefford described the new Plant Science Building at the University of Hawaii.
g) Speaker of the evening, Mr. Les Hannibal was introduced by Paul Yamaka. Subject was the ornamental Amaryllidaceae, especially the Crinums.

May 11, 1970.

a) Introduction of Honorary Members. (See Honor Awards.)
b) Speaker of the evening, Dr. Jacques Barrau spoke on Ethnobotany of the South Pacific. Dr. Barrau is a leading authority on this subject. He was brought to Hawaii by the East-West Center to participate in the May 13-15 conference on Food Problems in Asia and the Pacific. In 1963, he edited the Bishop Museum publication, "Plants and the Migrations of Pacific Peoples."

June 1, 1970.

a) Award--"Senior Most Likely to Reflect Credit Upon Botany." (See Honor Awards.)
b) Flora Pacifica invites assistance by volunteers for its Fall exhibition.
c) Treasurer Robert M. Warner reported that only 162 members have paid their dues up to date; 87 are one to three years in arrears. Upon the recommendation of the Executive Committee, a motion was passed that U. S. mainland and foreign libraries and other institutions on the mailing list for the NEWSLETTER be asked to pay for subscriptions. Local libraries and news media will be continued on the free circulation list.
d) Speaker of the evening, Dennis A. McLain, Estension Horticulturist, University of Hawaii. His subject was "Rare and Unusual Ornamentals for Hawaii."

PUBLICATIONS

Two publications by the Department of Land and Natural Resources should be called to the attention of botanists because they contain considerable significant material.

1968-69 Report to the Governor. State of Hawaii. Department of Land Resources. 83 pages. This document contains the annual reports of the Divisions, including Parks, Fish and Game, Lands, Forestry, and Land and Water Development. Also included are voluminous statistics on land areas, ownership, receipts, uses, and accomplishments.

Aloha Aina. A monthly magazine, first issued in March 1970. It contains articles in semi-popular style concerning the work of the Department. Liberal use is made of photographs.

Recent Literature

Barmettler, Edmund R., Donald L. Plucknett, Horace F. Clay, and Samuel T. Hata. June,1967
The Armed Forces Market for Agricultural Products in Hawaii. University of Hawaii. Agr. Expt. Sta., Agr. Econ. Report No. 68, 86 pp.

Barmettler, Edmund P., and Pattur R. J. Prasa. Dec.,1967
The Hawaiian Nursery and Related Landscape Industry. Univ. of Hawaii. Agr. Expt. Sta., Report No. 74, 36 pp.

Brekke, John, Catherine Cavaletto and Allan E. Stafford. 1968
Mango Puree Processing. Univ. of Hawaii. Agric. Expt. Sta., Tech. Progress Rep. No. 167, 10 pp.

Collier, William L., Jack R. Davidson, and Samuel G. Camp. Dec.,1967
Growing Celery on the Island of Hawaii--Production Pactices, Costs, and Returns. Univ. of Hawaii. Agr. Estp. Sta., Agr. Econ. Rep. No. 78, 32 pp.

Degener, Otto. July-Aug., 1969
Palmyre L. d. c. Mitchell, 1880-1968. Bulletin of the Torrey Botanical Club. Vol. 96(4): 495-497.

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Flora Hawaiiensis. Fourteen new insert leaves dated from June 20, 1969 to Jan. 20, 1970. These deal with "Field Work", 5 leaves; GLEICHENIACEAE, 2 leaves; COMPOSITAE, 2 leaves; CAPRIFOLIACEAE, 2 leaves; SCROPHULARIACEAE, 1 leaf; RUTACEAE, 2 leaves.

Goos, R. D. April, 1970
Phalloid Fungi in Hawaii. Reprinted from Pacific Science, Vol. 24:(2).

Harpole, George B. 1969
Wood Products in Hawaii--consumption, production, and trade. U.S.D.A. Forest Service, Res. Note PSW-198, 5 pp.

Hawaii. University. Nov., 1968
Cooperative Extension Service. Its Leaflet No. 137. 2 leaves.

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Cooperative Extension Service. Its Leaflet No. 143. 1 leaf.

Hormann, Hans. 1969
Ein neues Moos aus Hawaii: Mniobryoides Degeneriae. Sitzungsberichte d. mathem.-naturw. Kl., Abt. I, 177. Bd., 4. bis 4. Heft: 133-139, Taf. 1-3.

Little, E. L., Jr. 1969
Native trees of Hawaii. American Forests, Feb. 1969. Reprinted in "The Elepaio" 30:11-15.

Maciolek, J. A. Nov., 1969
Freshwater lakes in Hawaii. Verh. Internat. Verin. Limnol., 17, 386-391. Stuttgart.

Pacific Southwest Forest and Range Expt. Sta. 1969
Publications for 1969. Forest Service, U. S. Dept. Agric. 11 pp.

Pacific Southwest Forest and Range Expt. Sta. 1969
Research Progress 1969. Forest Service, U. S. Dept Agric. 24 pp.

Rankine, L. B., A. B. Larson, and R. E. Green. Oct., 1968
Economic Evaluation of Winter Vegetable Production on Molokai. University of Hawaii. Agr. Expt. Sta., Agr. Econ. Rep. 80, 18 pp.

Saito, Yuzuru. 1969
The algal genus Laurencia from the Hawaiian Islands, the Philippine Islands, and adjacent areas. Pacific Science 23:148-160.

Sherman, Martin, and Fernando F. Sanchez. 1968
Further Studies on the Toxicity of Insecticides and Acaricides to the Papaya. University of Hawaii, Agr. Expt. Sta., Tech. Bull. No. 74. 63 pp.

Spielman, Heinz. 1968
Demand Analysis and Market Development for Fresh and Potentially Gamma-Irradiated Papaya on U. S. Mainland Markets. University of Hawaii. Agric. Expt. Sta., Agr. Econ. Bull. No. 28, 50 pp.

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Editor Russell K. LeBarron
(Hawaii Division of Forestry)

THE HAWAIIAN BOTANICAL SOCIETY was founded in 1924 to "advance the science of Botany in all its applications, encourage research in Botany in all its phases," and "promote the welfare of its members and to develop the spirit of good fellowship and cooperation among the." "Any person interested in the plant life of the Hawaiian Islands is eligible for membership in this Society."

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